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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/556,802

12/21/2006

Anco Heringa

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07/31/2007

PHILIPS ELECTRONICS NORTH AMERICA CORPORATION  
INTELLECTUAL PROPERTY & STANDARDS  
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EXAMINER

VALENTINE, JAMI M

ART UNIT

PAPER NUMBER

2815

MAIL DATE

DELIVERY MODE

07/31/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/556,802

Applicant(s)

HERINGA, ANCO

Examiner

Jami M. Valentine, Ph.D.

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 14 November 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 11/14/05
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Status of the Application***

1. **Claims 1-18** are pending in this application.

### ***Inventorship***

2. Acknowledgment is made that the Declaration was received on 12/21/06. The examiner notes that the **three** inventors listed on the Declaration are the same as those listed on the initial Transmittal Letter filed 11/14/05. However, there is only **one** inventor of record in the Filing receipt mailed 1/19/07, in the US Patent Application Publication (2007/0090470) published 4/26/07, and in the application file wrapper.

### ***US National Phase of PCT***

3. Acknowledgment is made that this application is the US national phase of international application PCT/IB04/01527 filed 6 May 2004 which designated the U.S. and claims benefit of UK 0324096.7, filed 15 October 2003 and UK 0310928.7, filed 13 May 2003.

### ***Foreign Priority***

4. Acknowledgment is made that the certified copy of the foreign priority document has been received in the national stage application from the International Bureau.

### ***Information Disclosure Statement***

5. Acknowledgment is made that the information disclosure statement has been received and considered by the examiner. If the applicant is aware of any prior art or any other co-pending applications not already of record, he/she is reminded of his/her duty under 37 CFR 1.56 to disclose the same.

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***Drawings***

6. Figure 1A, 1B, and 3B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Objections***

7. Claims 7 and 8 are objected to because of the following informalities: Claims 7 and 8 have grammatical errors. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. **Claims 1-18** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. Per **Claims 1**, the following language is indefinite: "...semiconductor region... field shaping region... first and second capacitive voltage coupling regions..." and "...the p and n semiconductor regions..." It is unclear whether these "regions" are layers, structures or conceptual areas. The use of the term "region" produces a particular lack of clarity with regard

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to the dependent claims. These claims are deficient because they are imprecise. Hence, one of ordinary skill in the art would not be reasonably apprised of the scope of the invention and this claim is rendered indefinite

11. Per **Claim 6**, the following language is indefinite: "...including where the insulating field shaping region is adjacent and bridges both the p side and the n side..." it is unclear what is meant by the use of the term bridges. The term bridge has multiple meanings in the electrical arts, including that of a specific type of electrical structure. It is unclear whether "bridges" is intended to introduce further structure, or if it is intended to mean that the insulating field shaping region is a simple link between the p side and the n side. This claim is deficient because it is imprecise. Hence, one of ordinary skill in the art would not be reasonably apprised of the scope of the invention and this claim is rendered indefinite.

12. Per **Claim 9**, the following language is indefinite: "...comprises one of the p and n semiconductor regions..." Claim 9 depends on claim 1, however, claim 1 does not recite p and n semiconductor regions. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 102***

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

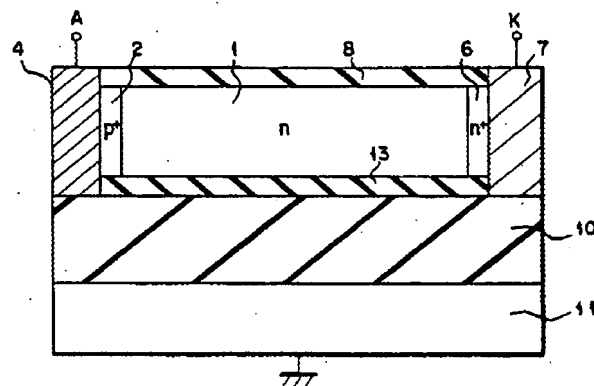
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. **Claims 1-3 and 5-18** are rejected under 35 U.S.C. 102(b) as being anticipated by Matsushita et al. (US Patent No 5,2323,071) hereinafter referred to as Matsushita.

15. Per **Claim 1** Matsushita (e.g. figure 6) discloses a semiconductor device, including

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- a semiconductor region having a pn junction (between n-(1) and p-(2)) and
- a field shaping region ((8) and (13)) located adjacent the pn junction,
- wherein the field shaping region ((8) and (13)) is insulating material and is coupled to first (4) and second (7) capacitive voltage coupling regions. (column 4 lines 65-69 discloses that regions (8) and (13) can be  $\text{TiO}_2$ , which is an insulating material)



*Prior Art: Matsushita Figure 6*

16. Additionally, Claim 1 recites the performance properties of the device (e.g. the properties of the field shaping region, the capacitive voltage coupling regions and device as a whole). These functional limitations do not distinguish the claimed device over the prior art, since it appears that these limitations can be performed by the prior art structure of Matsushita. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429,1431-32 (Fed. Cir. 1997) See MPEP 2114

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17. Further, the limitations “the material and capacitive coupling of the field shaping region being such that...” are product-by-process limitations. While product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. *In re Hirao*, 190 USPQ 15 at 17(footnote 3). The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) See also *in re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 116 *in re Wertheim*, 191 USPQ 90 (209 USPQ 254 does not deal with this issue); and *In re Marosi et al*, 218 USPQ 289 final product per se which must be determined in a "product by, all of" claim, and not the patentability of the process, and that an old or obvious product, whether claimed in "product by process" claims or not. Note that Applicant has the burden of proof in such cases, as the above case law makes clear.

18. Per **Claims 2 and 3** Matsushita (e.g. figure 6) discloses the device of claim 1, including where the field shaping region ((8) and (13)) insulating material has a dielectric constant greater than that of both silicon dioxide and silicon nitride. Matsushita (column 4 lines 65-69) discloses that regions (8) and (13) can be “TiO<sub>2</sub> or BaTiO<sub>3</sub>, or the like” which both have dielectric constants greater than that of both silicon dioxide and silicon nitride. (“Permittivity (Dielectric Constant) of Inorganic Solids” in *CRC Handbook of Chemistry and Physics, Internet Version 2007, (87<sup>th</sup> edition)*, David R. Lide, ed., Taylor and Francis, Boca Raton FL is provided as a teaching reference )

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19. Per **Claim 5** Matsushita (figure 7) discloses the device of claim 1, including where the insulating field shaping region (13) is adjacent only the n side of the pn junction. (see figure 7)

20. Per **Claim 6** Matsushita (e.g. figure 6) discloses the device of claim 1, including where the insulating field shaping region is adjacent and bridges both the p side and the n side of the pn junction. (see figure 6).

21. Per **Claim 7** Matsushita (e.g. figure 7) discloses the device of claim 5, including where the insulating field shaping region (8) is adjacent and bridges both the p side and the n side of the pn junction. (see figure 7).

22. Per **Claim 8** Matsushita (e.g. figure 7) discloses the device of claim 5, including where the insulating field shaping region (8) is adjacent both sides of the lateral extent of the pn junctions. (see figure 7).

23. Per **Claim 9** Matsushita (figure 6) discloses the device of claim 1, including where at least one of the first (4) and second (7) capacitive voltage coupling regions comprises one of the p and n semiconductor regions which form the pn junction. (see figure 6).

24. Per **Claim 10** Matsushita (figure 6) discloses the device of claim 1, including where at least one of the first (4) and second ((6) and (7)) capacitive voltage coupling regions comprises a more highly doped semiconductor region (6) of the same conductivity type and adjacent one of the p and n semiconductor regions which form the pn junction. (see figure 6).

25. Per **Claim 11** Matsushita discloses the device of claim 1, including where at least of the first (4) and second (7) capacitive voltage coupling regions comprises a conductive material region (column 3 lines 36-45).



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26. Per **Claim 12** Matsushita discloses the device of claim 11, including where the conductive material region is integral with a main electrode of the device. (column 3 lines 36-45).

27. Per **Claim 13** Matsushita (e.g. figure 3) discloses the device of claim 1, including where the capacitively coupled insulating field shaping region ((8) and (13)) is separated by an insulating region (9) from the semiconductor region having the pn junction (between n-(1) and p-(2)).

28. Per **Claim 14** Matsushita (e.g. figure 6) discloses the device of claim 1, including where the device is a diode device. (column 3 lines 29-45)

29. Additionally, Claim 14 recites the intended use of the pn junction device. These functional limitations do not distinguish the claimed device over the prior art, since it appears that these limitations can be performed by the prior art structure of Matsushita. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429,1431-32 (Fed. Cir. 1997) See MPEP 2114

30. **Claims 15–18** recite the intended use of the device. These functional limitations do not distinguish the claimed device over the prior art, since it appears that these limitations can be performed by the prior art structure of Matsushita. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429,1431-32 (Fed. Cir. 1997) See MPEP 2114

***Claim Rejections - 35 USC § 103***

31. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

32. This application may name joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

33. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsushita.

34. Per **Claim 4** Matsushita discloses the device of claim 3 including an insulating material as the field shaping ((column 4 lines 65-69) discloses that regions (8) and (13) can be "TiO<sub>2</sub> or BaTiO<sub>3</sub>, or the like" )

35. Matsushita fails to teach where the field shaping insulating material is tantalum oxide (Ta<sub>2</sub>O<sub>5</sub>).

36. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use tantalum oxide (Ta<sub>2</sub>O<sub>5</sub>) as the field shaping insulating material since it has been

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held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for its intended use as a matter of design choice. *In re Leshin*, 125 USPQ 416.

### ***Cited Prior Art***

37. The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Reference 1: US Patent Application Publication No 2001/0048131 by Hurkx et al.

Reference 2: "Permittivity (Dielectric Constant) of Inorganic Solids" in *CRC Handbook of Chemistry and Physics, Internet Version 2007, (87<sup>th</sup> edition)*, David R. Lide, ed., Taylor and Francis, Boca Raton FL is provided as a teaching reference

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jami M. Valentine, Ph.D. whose telephone number is (571) 272-9786. The examiner can normally be reached on Mon-Thurs 8:30am-7pm EST. **NOTE:** From June 18 through August 8<sup>th</sup>, The examiner will be available *only* on Thursdays and Fridays 8:30am-7pm EDT, due to jury duty service.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on (571) 272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

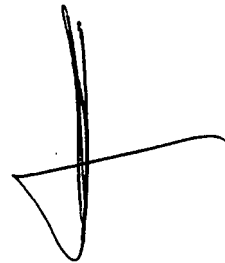
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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jami M Valentine, Ph.D.  
Examiner  
Art Unit 2815

JMV

A handwritten signature in black ink, appearing to be 'K. Parker', written over a horizontal line.

KENNETH PARKER  
SUPERVISORY PATENT EXAMINER